

GLASS AND CERAMICS

Volume 57, Numbers 1 – 12, 2000

[A translation of *Steklo i Keramika*]

English Russian

Volume 57, Number 1, January, 2000

SCIENCE FOR GLASS PRODUCTION

Formation Features of Thin Float Glass and Prospects for This Technology (A Review)

V. I. Kondrashov and V. S. Bezlyudnaya 3 4

Mechanism of the Interaction Between Quartz Glasses and the Lubricant-Coolant in Grinding

I. A. Gagina, A. A. Kanaev, N. P. Sokolova, and O. A. Khlebnikova 8 8

Structure of Glasses in the $\text{Na}_2\text{O} - \text{Fe}_2\text{O}_3 - \text{B}_2\text{O}_3 - \text{SiO}_2$ System

I. N. Dvornichenko and S. V. Matsenko 11 11

SCIENCE FOR CERAMIC PRODUCTION

Homogeneity Control in Heterogeneous Materials (A Review)

Yu. N. Kryuchkov 14 14

Features of Formation of the Contact Zone in the Glaze – Ceramics System

I. A. Levitskii, E. M. Dyatlova, T. V. Kolontaeva, and V. M. Shelikhina 18 17

Sintering Kinetics of Aluminum Oxide Ceramics with an Additive of Eutectic Composition

E. S. Lukin and N. A. Makarov 23 22

Sintered Ceramic Materials Produced from Hydromica Clays

G. P. Sedmale and U. Ya. Sedmalis 26 25

Basaltoid Rocks of the Akchinskoe Intrusion in the Production of Acid-Resistant Materials

G. T. Adylov, S. A. Gornostaeva, and N. A. Parshina 29 28

ENAMELS. COATINGS

Technological Specifics of Devitrified Composite Heat-Resistant Coatings for Nichrome Alloys

A. P. Zubekhin, E. A. Manyшева, and L. D. Ochкурова 30 29

Volume 57, Number 2, February, 2000

PROBLEMS OF AUTOMATION AND MECHANIZATION

Optimization of Glass Batch Preparation

V. V. Efremkov and V. P. Chalov 37 3

STANDARDIZATION AND QUALITY

Standards for Building Glass and Building-Glass Products Adopted in the Russian Federation

O. O. Emel'anova and A. G. Chesnokov 40 5

SCIENCE FOR GLASS PRODUCTION

Operation of a Glass-Melting Furnace with a Heat-Insulated Melting Tank

V. V. Fokin, V. I. Kondrashov, N. A. Khovanskaya, and Yu. V. Zverev 43 8

Cooling Capacity of Contemporary Hardening Diffusers

A. I. Shutov, I. A. Novikov, and A. A. Chistyakov 45 10

	English	Russian
Use of Hollow Glass Microspheres in Organosilicon Syntact Foam Plastics <i>V. Yu. Chukhlanov and É. P. Sysoev</i>	47	11
SCIENCE FOR CERAMIC PRODUCTION		
Pigmentation of Clays of the Gzhel' Deposit <i>V. M. Loginov and N. S. Yugai</i>	49	13
A Promising Direction in the Production of Sanitary Ware <i>V. G. Kosenko, A. A. Petrov, and L. G. Protasova</i>	55	18
Rational Electrothermal Conditions for Operation of Lanthanum Chromite Electric Heaters <i>B. I. Polyak and I. A. Zhigalkina</i>	57	20
Engobing of Wall Ceramics Using the Plasma Spraying Method <i>V. S. Bessmertnyi, N. M. Parshin, A. A. Lyashko, V. P. Krokhin, and A. A. Osykov</i>	61	23
Ceramic and Vitreous Materials Based on Plagioclase <i>Ya. Ya. Bol'shii, I. É. Kargane, K. T. Romanchuk, and U. Ya. Sedmalis</i>	64	26
Production of Iron-Containing Crystalline Glazes <i>I. N. Dvornichenko and S. V. Matsenko</i>	67	28
INDUSTRIAL EXPERIENCE		
Use of Robotics in Crystal Ware Decoration <i>N. F. Gerasimovich</i>	69	32

Volume 57, Number 3, March, 2000

SCIENCE FOR GLASS PRODUCTION

Heat-Absorbing Glass: Directions of Synthesis <i>V. I. Kondrashov, G. A. Polkan, I. N. Gorina, L. N. Bondareva, and Yu. V. Zverev</i>	75	3
Change in the Redox Potential of a Glass Melt Upon Introducing a Melting Catalyst into the Glass Batch <i>V. I. Kiyan, Yu. I. Mashir, and A. B. Atkarskaya</i>	78	5
Kinetic Specifics of the Synthesis of Luminescent Materials Using the Sol-Gel Method <i>N. V. Popovich and V. V. Fedorov</i>	81	8
Effect of the Redox Potential of the Glass Batch and Cullet on the Tinting of Industrially Produced Glass Containing Iron Oxides <i>N. F. Zhernovaya, N. I. Min'ko, V. I. Onishchuk, and L. I. Mel'nikova</i>	84	11

SCIENCE FOR CERAMIC PRODUCTION

Ceramic Tiles Containing Diopside and Clay Raw Materials from Khakassia <i>A. D. Shil'tsina and V. I. Vereshchagin</i>	87	13
Reinforced Ceramic Materials with Phosphate Binders <i>V. V. Guzev, E. M. Tret'yakova, and L. R. Ivanova</i>	91	16
A New Modification of Silicon Carbide with a Rhombic Lattice <i>A. N. Tsvigunov</i>	94	19
Specifics of Drying of Building Ceramics Made Using Lubricant-Coolant Waste <i>V. S. Paleichuk, V. A. Krupa, and V. V. Tkach</i>	98	23

COATINGS. ENAMELS

Production of Silicate Coatings from Glass-Forming Colloidal Solutions <i>Ya. I. Vakhula</i>	101	26
---	-----	----

AT THE ENTERPRISES AND INSTITUTES

A New Fire- and Explosion-Proof Lubricant for Glass-Shaping Molds <i>A. I. Kulikov</i>	105	30
---	-----	----

Volume 57, Number 4, April, 2000

SCIENCE FOR GLASS PRODUCTION

Modification of the Surface of Sheet Glass (A Review)

N. I. Min'ko, I. N. Mikhal'chuk, and M. Yu. Lipko. 109 3

Color Characteristics of a Parametric Series of Heat-Absorbing Toned Glasses

V. I. Kondrashov, Yu. V. Zverev, E. G. Mukhina, and V. V. Skokshin. 114 7

Computerized Graphical Representation of Types of Destruction of Hardened Glass

A. I. Shutov, P. V. Popov, and A. P. Kolos. 116 9

Relationship of Structural Phase Transformations and Properties of Sol-Gel Films in the $\text{Bi}_2\text{O}_3 - \text{TiO}_2 - \text{Fe}_2\text{O}_3$ System

A. B. Atkarskaya and V. I. Kiyan. 118 11

RAW MATERIALS

Raw-Material Resources of the Ural Region

N. F. Solodkii and M. N. Solodkaya. 123 15

SCIENCE FOR CERAMIC PRODUCTION

Glazing of Wall Ceramics Using Air Cooling (A Review)

V. S. Bessmertnyi, V. A. Panasenko, V. N. Glaz, V. P. Krokhin, and E. P. Nikiforova. 127 19

Phase Composition of Microspheres for Production of Heat-Insulating Corundum Ceramics

A. S. Vlasov and S. A. Postnikov. 130 22

Increase in the Specific Surface of Highly Porous Materials with a Cellular Structure

O. L. Smorygo, A. M. Romashko, L. V. Tsedik, and G. P. Okatova. 132 23

EFFECTIVE METHODS

A Method for Hardening Rapidly Wearing Parts

A. I. Kulikov. 136 27

Efficiency of a New Method for Making Ceramic Articles with a Fused-Drop Pattern

V. A. Aleko, V. A. Prokhvatilo, and V. P. Prokhvatilo. 138 28

ENAMELS

Enamel with the Aventurine Effect

S. Yu. Eliseev, S. P. Rodtsevich, and E. V. Dostanko. 140 30

Process of Formation of a High-Quality Enamel Coating

A. V. Nikitinenko. 143 32

Volume 57, Number 5, May, 2000

UTILIZATION OF WASTE

Low-Melting Glasses Based on Phosphate Ore Processing Products

O. F. Babadzhanova and N. I. Yashchishin. 149 3

SCIENCE FOR GLASS PRODUCTION

Dynamics of Thermal Conditions of Molds in Molding Glass Articles

N. D. Vorob'ev, A. I. Shutov, K. G. Gunchenko, V. I. Yagnyuk, A. I. Nepomnyashchii, D. V. Varnavskii, and A. S. Blintsovskii. 152 6

Structural Interpretation of the Concentration Dependence of Molar Volume in Ternary Aluminosilicate Glasses Containing Oxides of the First and Second Groups of the Periodic System

A. I. Rabukhin. 154 8

	English	Russian
Drying of Bulk Silica Gels Molded from Tetraethylorthosilicate and Aerosil <i>E. N. Poddenezhnyi, I. P. Kravchenko, I. M. Mel'nikhenko, M. N. Kapshai, and A. A. Boiko</i>	158	11
Hardening of Mold Parts at Glass Factories <i>L. B. Barilovich, V. N. Tkachuk, L. P. Vergeles, V. O. Mikulenok, V. A. Rybakov, and V. F. Palamarchuk</i>	162	15
SCIENCE FOR CERAMIC PRODUCTION		
Correlation of Aqueous-Physical, Structural-Mechanical, and Thermophysical Properties of Moist Disperse Materials <i>V. A. Lotov</i>	164	17
Glazed Wall Ceramics with Improved Physicomechanical and Decorative Properties <i>V. S. Bessmertnyi, M. V. Seroshtan, A. A. Lyashko, V. P. Krokhin, and N. M. Parshin</i>	169	21
Physicochemical Properties of Hydroxylapatite Produced by Precipitation <i>N. M. Longinova, N. A. Kozyreva, and S. V. Lipochkin</i>	172	24
Correlation of Properties of Composite Materials Based on Siloxane Binder with the Type of Filler <i>I. M. Yao and O. S. Sirotkin</i>	174	26
Improvement of Facing Brick Production <i>B. M. Datsenko, N. P. Grebenyuk, O. V. Khromenko, and S. I. Krupa</i>	177	28
ENAMELS		
Boronizing as a New Method for Treatment of Steel for One-Coat Enameling <i>A. P. Zubekhin, N. V. Veropakha, and E. A. Yatsenko</i>	179	30
Glass Ceramic Enamels with Increased Conductivity <i>V. V. Tavgen'</i>	183	33
Volume 57, Number 6, June, 2000		
PROBLEMS OF ECONOMY		
Evaporation Cooling of Glass-Melting Furnaces (A Review) <i>N. I. Min'ko, Yu. S. Zaitsev, N. N. Zaitseva, R. L. Bilinskii, and Yu. M. Shershnev</i>	187	3
Improvement of Thermal Operations of Glass-Melting Furnaces <i>S. N. Gushchin, V. B. Kut'in, and P. N. Bodnar</i>	190	6
ECOLOGY AND PRODUCTION		
Barium-Containing Glass as an Efficient Substitute for High-Lead Glass in the Production of Light Sources <i>V. V. Lityushkin, A. I. Kovalenko, A. P. Sivko, L. P. Smirnova, and M. A. Filimonova</i>	193	9
SCIENCE FOR GLASS PRODUCTION		
Development of Float Process in Sheet Glass Production <i>V. I. Kondrashov, E. V. Fainberg, and V. S. Bezlyudnaya</i>	195	11
Statistical Characteristic of the Impact Strength of Hardened Glass <i>A. I. Shutov, I. A. Novikov, A. A. Chistyakov, and V. B. Gerasimenko</i>	199	14
Synthesis and Properties of Sodium-Borophosphate and Sodium-Alumophosphate Glasses <i>T. K. Pavlushkina and O. A. Gladushko</i>	201	16
Inhomogeneity and Mesostructure of Oxide Coating on Glass <i>N. A. Sergeev, Yu. V. Borodin, and M. N. Frolova</i>	205	19
SCIENCE FOR CERAMIC PRODUCTION		
Ceramics for Motor Building <i>E. B. Bendovskii</i>	207	21
Porous Alumina-Based Ceramic <i>E. M. Tomilina, O. V. Pronina, E. S. Lukin, and G. G. Kagramanov</i>	210	23

	English	Russian
Sintering of Fireclay-Kaolin Mixtures with Refractory Clay <i>L. D. Pilipchatin</i>	212	25
COATINGS		
Coatings Based on Phosphate Binders <i>V. I. Vereshchagin, Vas. V. Guzev, Vit. V. Guzev</i>	215	28
INDUSTRIAL EXPERIENCE		
Annealing Furnaces: Quality Competition Winners <i>Yu. M. Shershnev</i>	218	30
Advanced Process of Production of Long-Length Tube Parts from Electroceramics <i>A. A. Pelykh</i>	221	32
NEW DEVELOPMENTS		
New Box Electric Furnaces from the TermIKS Company for Glass Bending and Sealing of Double Glass Panes	224	34

Volume 57, Number 7, July, 2000

SCIENCE FOR GLASS PRODUCTION

Use of Local Raw Materials in the Production of Light-Resisting Float Glass <i>V. I. Kondrashov and N. N. Shcherbakova</i>	227	3
Microhardness of Sol-Gel Films with Various Textures <i>A. B. Atkarskaya and V. I. Kiyan</i>	230	5
Application of Dyed Slags of Silicomanganese Production to Manufacturing of Glass-Ceramic Materials <i>N. I. Min'ko, A. V. Gubarev, and O. A. Gubareva</i>	234	8

SCIENCE FOR CERAMIC PRODUCTION

A Thermal Study of Polymineal Clays of the Gzhel' Deposit <i>V. M. Loginov, T. L. Neklyudova, and N. S. Yugai</i>	236	11
Detonation Synthesis and Crystal Structure of Six-Layer Silicon Carbide <i>S. I. Troyanov, A. N. Tsvigunov, V. G. Khotin, and T. B. Puzyreva</i>	241	15
Reproducibility of the Structure and Properties of Parts and Their Description Within the Framework of Nonlinear Dynamics <i>A. Yu. Loskutov</i>	243	17
Porous Ceramics Obtained from Strontium Zirconate <i>B. I. Polyak, T. S. Marinina, and S. A. Pershikov</i>	247	20

INDUSTRIAL EXPERIENCE

Unfritted Opaque Glaze for Ceramic Sanitarware <i>V. I. Voevodin</i>	250	23
---	-----	----

UTILIZATION OF WASTE

Ceramic Tiles Made of Granular Technogenic Raw Materials <i>A. D. Shil'tsina and V. M. Selivanov</i>	252	24
---	-----	----

Volume 57, Number 8, August, 2000

SCIENCE FOR GLASS PRODUCTION

Factors of Surface and Volumetric Reactions in Glass Technology Processes <i>Yu. A. Guloyan</i>	259	9
--	-----	---

	English	Russian
Physical Modeling of the Glass Melt Hydrodynamics in a Highly Efficient Melting Furnace for Container Glass <i>V. A. Tolstov, V. N. Kiselev, S. S. Denisova, A. V. Kas'yanova, and K. A. Fomin</i>	263	14
A Study of Physicochemical Phenomena in Evaluation of Chemical Corrosion in Glass <i>Yu. A. Guloyan and V. F. Shelomentseva</i>	267	18
Combined Evaluation of the Role of Impurities and Small Additives in Glass Production <i>V. A. Fedorova</i>	272	22
INDUSTRIAL EXPERIENCE		
Domestic Technologies, Materials, and Equipment for Decorative Coatings <i>O. Yu. Kineeva, G. M. Shigaleva, and V. A. Fedorova</i>	275	31
NEW TECHNOLOGIES AND EQUIPMENT		
Ir-Annealing Technology for Glass Products <i>V. E. Tyutyunnik and Yu. A. Guloyan</i>	277	33
RAISING PRODUCTION EFFICIENCY		
Hardening of Parts of Glass-Shaping Machines Using Titanium Nitride <i>G. V. Ermakov, V. D. Yageman, E. N. Yageman, R. M. Zavistnova, and E. P. Garin</i>	281	38
Production of High-Alumina Refractory and Tin Oxide Products <i>G. M. Shigaleva, E. V. Khodakova, and E. V. Rudkovskii</i>	284	40
Small Glass-Melting Furnaces for Clear, Tinted, and Specialized Glass <i>A. A. Dymov and V. A. Fedorov</i>	286	42
Development and Implementation of Automatic Control Systems for Glass-Melting Furnaces <i>A. A. Dobrolyubov and A. I. Figurkin</i>	288	43
ENVIRONMENTAL SAFETY		
Environmental Safety in Melting Glass Using Different Types of Fuel <i>S. I. Alimova and M. V. Shapilova</i>	290	44
Environmental Problems in the Production of Household and Crystal Glass <i>M. V. Shapilova and S. I. Alimova</i>	293	47
Volume 57, Number 9, September, 2000		
SCIENCE FOR GLASS PRODUCTION		
An Energy-Related Method for Determining Impact Strength in Sheet Glass <i>A. I. Shutov, I. A. Novikov, and A. A. Chistyakov</i>	299	10
Formation Specifics of Heat-Absorbing Float Glass <i>V. I. Kondrashov, V. S. Bezlyudnaya, and A. L. Ivanov</i>	302	12
Modification of Alkali-Free Glass Compositions for Fiberglass Production <i>M. Yu. Kudryavtsev, N. V. Popovich, N. Yu. Mikhailenko, and Yu. I. Kolesov</i>	304	14
Analysis of Stability of Polished Sheet Glass Production <i>R. I. Makarov, I. R. Dubov, and S. A. Lukashin</i>	308	19
Chemically Resistant Coating for Silicate Glass Protection <i>T. K. Pavlushkina and O. A. Gladushko</i>	310	21
THERMAL INSULATION		
A Method for Estimating Heat-Shielding Properties of Mineral Wool Insulation Based on Silicate Fibrous Materials <i>V. G. Petrov-Denisov, V. S. Zholudov, and V. V. Gur'ev</i>	314	24

Volume 57, Number 10, October, 2000

SCIENCE FOR CERAMIC PRODUCTION

Intensification of Sintering of Calcium-Bearing Ceramic Mixtures

N. D. Yatsenko, N. A. Vil'bitskaysa, S. P. Golovanova, A. P. Zubekhin, and V. P. Rat'kova 318 32

Biocomposite Calcium-Phosphate Materials Used in Osteoplastic Surgery

B. I. Beletskii, V. I. Shumskii, A. A. Nikitin, and E. B. Vlasova 322 35

DEVELOPMENT OF THE RESOURCES

Prospects of Developing Obskii Alluvial and Watershed Sands in West Siberia

O. V. Paryushkina, N. A. Mamina, and V. N. Kizeyarov 326 38

EFFICIENCY AND QUALITY

Use of Magnetic Separation in Production of Electromelted Refractories

E. V. Bychkov, V. D. Filatov, S. N. Knyazev, N. N. Konev, and I. P. Salo 328 42

SCIENCE FOR GLASS PRODUCTION

The Effect of Process Parameters on the Stability of Molybdenum Electrodes in Glass-Melting Furnace

N. I. Min'ko, N. F. Zhernovaya, O. I. Tkachenko, V. Yu. Krasavin, and Z. P. Baskova 333 3

Structural Interpretation of the Concentration Dependences of Molar Volume in Lead Silicate Glasses

A. I. Rabukhin 338 7

Spatial Grid for Estimation of Thermal Fields in Glass Molds

A. I. Shutov, N. D. Vorob'ev, A. I. Nepomnyashchii, A. S. Ostapko, A. S. Blintsovskii, K. G. Gunchenko, and V. I. Yagnyuk 342 11

Functional Purpose and Design of the Slag Chamber

V. S. Bezlyudnaya, E. V. Fainberg, and I. A. Frolova 344 12

SCIENCE FOR CERAMIC PRODUCTION

Principal Bifurcations in Firing of Compact Oxide Ceramics

A. B. Belyakov 345 13

Hydroxyapatite-Wollastonite Bioceramics

V. V. Shumkova, V. M. Pogrebenkov, A. V. Karlov, V. V. Kozik, and V. I. Vereshchagin 350 18

Stages of Ceramic Structure Formation in the Presence of Additives

A. K. Abdurakhmanov, A. M. Eminov, and G. N. Maslennikova 354 21

Combined Effect of Microwave Field and Focused Laser Radiation on Dielectrics

V. A. Vasin 357 23

EQUIPMENT

Phosphate Carburizing of Glass Molds and Glass-Shaping Machines

A. I. Kulikov 361 27

Efficient Technology and Equipment for Production of Flowerpot Sets

V. A. Aleko 363 28

Volume 57, Number 11, November, 2000

SCIENCE FOR GLASS PRODUCTION

Monitoring the Stressed State of Structural Glass Blocks

A. G. Filatov 367 3

Sol-Gel Luminophors Based on Diopside

O. P. Pogrebisskaya, N. V. Popovich, S. S. Galaktionov, and P. D. Sarkisov 370 5

Surface Energy of Crystalline and Vitreous Silica

Yu. K. Shchipalov 374 8

	English	Russian
Fiberization of Silicate Melts in an Acoustic Field <i>V. V. Gur'ev, R. D. Tikhonov, É. M. Beglyarov, and V. R. Tikhonova</i>	378	12
PROBLEMS OF QUALITY		
Effect of the Composition of the Residual Atmosphere on the Quality of Aluminum Mirror Spraying <i>V. I. Kozhevnikov, F. Z. Gil'mutdinov, and O. M. Kanunnikova</i>	382	15
UTILIZATION OF WASTE		
Use of Galvanic Slime in Production of Ceramic Facade Tiles <i>A. K. Abdurakhmanov, A. M. Éminov, and G. N. Maslennikova</i>	385	18
A Ceramic Pigment Based on a By-Product of Nickel Production <i>A. N. Emel'yanov</i>	387	20
Use of Waste in a Vitreous Coating for Brick <i>Yu. A. Shchepochkina, M. V. Akulova, and S. V. Fedosov</i>	389	21
SCIENCE FOR CERAMIC PRODUCTION		
Basalt Tuff Ceramics <i>L. I. Dvorkin, O. L. Dvorkin, I. G. Skrypnik, and L. I. Nikhaeva</i>	390	22
Synthesis of a New Modification of Aluminum Oxide, Gahnite, and Zincite in Detonation <i>A. N. Tsvigunov, V. G. Khotin, V. V. Vaskevich, A. S. Krasikov, B. S. Svetlov, and A. S. Vlasov</i>	392	24
Composite Powders of the TiC – TiB ₂ System <i>I. E. Degrave and Yu. P. Udalov</i>	396	27
Refinement of the Technology for Glazing Sanitary Ware <i>V. G. Kosenko and L. G. Protasova</i>	399	30
Red Glaze <i>R. V. Manukyan and N. S. Davydova</i>	401	32
COATINGS. ENAMELS		
A Low-Boron Dielectric Coating for Aluminum <i>S. Yu. Eliseev, S. P. Rodtsevich, and G. F. Lukashevich</i>	402	33
Volume 57, Number 12, December, 2000		
SCIENCE FOR GLASS AND CERAMIC PRODUCTION		
Opacified Glazes Based on Liquefying Glass of Low-Alkali Compositions <i>I. A. Levitskii</i>	407	7
Porous Glass Ceramic Bioimplants <i>N. M. Bobkova, N. I. Zayats, T. V. Kolontaeva, G. N. Pun'ko, and G. B. Zakharevich</i>	412	11
Effect of Granite Screenings on the Properties of Acid-Resistant Materials <i>I. V. Pishch, G. N. Pun'ko, and N. A. Kirdyashkina</i>	415	14
Synthesis of Tialite Ceramics Using the Method of Heterogenous Precipitation <i>N. M. Bobkoba and N. F. Popovskaya</i>	418	16
Synthesis of Tinted Glaze Coatings Based on Metadiabase <i>Yu. S. Radchenko and I. A. Levitskii</i>	423	20
Intensification of Sintering of Mullite-Cordierite Ceramics Using Mineralizers <i>E. M. Dyatlova, G. Ya. Minenkova, and T. V. Kolontaeva</i>	427	24
Glazed Majolica Articles Produced by Single-Stage Firing <i>I. A. Levitskii and V. A. Biryuk</i>	431	27
Optimization of Ceramic Granite Compositions <i>I. M. Tereshchenko, G. N. Pun'ko, and L. V. Serikova</i>	435	31